

Evaluating Economic Justifications for Alcohol Restrictions

By EDWARD STRINGHAM and ILKAY PULAN*

ABSTRACT. Does economics justify restricting alcohol consumption? A new line of research concludes that alcohol involves significant social costs and that various restrictions would lead to net social gains. This article focuses on Levy and Miller (1995), who conduct a cost-benefit analysis of serving-intoxicated-patron laws. We administer a survey of taverns in Washtenaw County, Michigan, to investigate the plausibility of some of Levy and Miller's claims. We find a number of problems with their economic discussion: in addition to a number of problematic assumptions, they count private costs as social costs and completely ignore consumer and producer surplus associated with alcohol. We find their assumptions bias the results in favor of the restrictions. Despite their popularity in public policy debates, these economic justifications for restricting alcohol are dubious.

I

Introduction

ARE THERE ECONOMIC REASONS for restricting alcohol consumption? Although economists typically consider market choices to be welfare enhancing, a new series of articles concludes that restricting alcohol consumption is cost-benefit efficient (e.g., Brown and Jewell 1996; Brown, Jewell, and Richer 1996; Cutler 1996; Chesson, Harrison, and Kassler 2000). Two of the main contributors to this line of research, David T. Levy and Ted R. Miller, unequivocally judge that market

*The authors are at the Department of Economics, San Jose State University, San Jose, CA 95192-0114; e-mail: edward.stringham@sjsu.edu. We would like to thank Matthew Brown, Daniel Klein, Thayer Watkins, the editor, and anonymous referees for helpful comments and suggestions. A grant from the Atlas Foundation for Economic Research is greatly appreciated. The usual disclaimer applies.

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choices with respect to alcohol involve significant social costs (Levy and Miller 1995; Miller, Galbraith, and Lawrence 1998; Miller, Lestina, and Spicer 1998; Miller and Levy 1998; Miller, Spicer, and Levy 1999; Levy, Miller, and Cox 1999; Levy and Miller, 2000). Unlike most academic publications, Levy and Miller's work has been influential in academic circles, public discourse, and public policy. The website of Mothers Against Drunk Driving devotes an entire section to the economic costs of alcohol, relying almost exclusively on estimates in various articles by Miller and his colleagues. Many of Levy and Miller's studies are influential. For example, Levy and Miller (1995) is cited by governments on both sides of the Atlantic. *The Impaired Driving State Cost Fact Sheets of the National Highway Traffic Safety Administration* estimate costs of alcohol using the "the methods in Levy and Miller (1995)" (Jensen et al. 2002), and other government agencies, such as England's Home Office (Deehan 1999) and Scotland's Scottish Executive (Ludbrook et al. 2001) rely on Levy and Miller (1995) as well.¹ Does the dismal science teach us that we should have a dismal opinion of drinking?

Upon closer inspection, however, many estimates of the social savings of restricting alcohol are far from convincing. In this article we opt to focus on one article by David. T. Levy of the Department of Economics and Finance of the University of Baltimore and Ted R. Miller of the National Public Services Research Institute. Levy and Miller (1995) provides a detailed account of a Michigan program that stepped up enforcement of serving laws. It concludes: "The benefits greatly exceed the costs no matter which of the above benefit measures is used" (1995: 245). If the results of Levy and Miller (1995) and other studies are at all generalizable, the net monetary benefits of such policies would be substantial.

High-level appearance notwithstanding, we find a number of problems in the discussion of Levy and Miller (1995). Although these economists hold the utmost credentials, having published in *American Economic Review*, *Journal of Law and Economics*, and *Southern Economic Journal*, our findings bring into question the soundness of their results. In addition to making a number of questionable assumptions, Levy and Miller count private costs as social costs and ignore whole classes of benefits. We conclude that Levy and Miller's cost-

benefit analysis is less an example of scientific research and more a technical-appearing justification of conclusions they already support. Despite their popularity in public policy debates, these economic justifications for restricting alcohol are on shaky ground.

II

Review of the Cost-Benefit Analysis of Levy and Miller

LEVY AND MILLER CONSIDER CUSTOMERS becoming intoxicated in taverns a problem because a percentage later drives. One option is to prevent all customers from becoming intoxicated. Levy and Miller (1995) conduct a cost-benefit analysis of a 1990–1991 program in which police in Washtenaw County, Michigan, increased enforcement of serving-intoxicated-patron (SIP) laws. Plainclothes officers probed taverns and issued citations against those who served alcohol to intoxicated patrons. At the end of the first year, taverns' refusal to serve intoxicated patrons increased from 17 percent to 41 percent, and the percentage of driving while intoxicated (DWI) arrestees whose last drink was at a tavern decreased from 31.7 percent to 23.3 percent (Levy and Miller 1995: 242).

To Levy and Miller, the primary benefit of the program is to decrease costs associated with DWIs. They estimate benefits based on the decline of tavern-related DWIs using the following formula:

$$B = \delta x \sum_{i=1}^3 n_i C_i$$

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δ is the percentage decline in DWIs due to the program, x represents the alcohol-related incidents that occurred prior to the program, n_i denotes the number of DWI incidents, and c_i denotes the average cost per incident where i indicates the incident type (1 = fatality, 2 = injury, 3 = property damage). δ is derived from the data about DWIs and another formula where "A = absolute value of reduction in DWIs due to the SIP program, B = the number of tavern-related DWIs before the SIP program, C = the number of total DWIs before the SIP

program" (Levy and Miller 1995: 243). Before the program, the ratio of tavern-related DWIs to total DWIs (B/C) was 31.7 percent. Afterward, the ratio of tavern-related DWIs to total DWIs $[(B - A)/(C - A)]$ was 23.3 percent. Levy and Miller derive the decrease in alcohol-related incidents as follows:

$$[(B - A)/(C - A)] = 0.233$$

$$B = 0.233 (C - A) + A$$

$$B = 0.233C + 0.767A$$

$$B/C = 0.317$$

$$0.317C = 0.233C + 0.767A$$

$$0.317 = 0.233 + 0.767A/C$$

$$A/C = \delta = 0.11$$

(Levy and Miller 1995: 243)

They then estimate the average cost per accident to assess the cost savings of the program. Levy and Miller (1995: 244) create two estimates of costs. The "monetary cost" deals with direct dollar losses, such as health care, property losses, and human capital losses. "Comprehensive costs" includes pain, suffering, and lost quality of life. Levy and Miller present both "External Costs" (Table 1), which estimates costs imposed on other people, and "Total Costs" (Table 2), which includes costs borne by the drunk drivers themselves.

Multiplying the average cost per accident with the estimated decrease in accidents gives the cost savings of the program. For "External Costs," Levy and Miller estimate the program would save \$2.3 million in monetary costs and \$4.9 million in comprehensive costs. For "Total Costs," they estimate the program to save \$3.7 million in monetary costs and \$10.1 million in comprehensive costs (1995: 244). According to these authors (1995: 245), the costs of the program come to \$51,400, which is much lower than estimated benefits. By any measure in Levy and Miller, the benefits of the program substantially exceed the costs.

III

Problems with the Cost-Benefit Analysis of Levy and Miller

THE CONCLUSIONS OF THIS STUDY ARE CLEAR. But before willingly accepting the policy prescriptions, the public should make certain the results are sound. Although the analysis in Levy and Miller appears quite

Table 1
Levy and Miller's Estimates of External U.S. Costs of DWI Crashes by Incident Severity and Cost Category (in 1990 Dollars)*

	Fatal	Nonfatal Injury	PDO Vehicle	Costs for All Cases (\$ Millions)
Medical	6,024	3,840	—	3,749
Emergency Services	930	194	24	281
Productivity	289,985	4,988	35	9,860
Employer Costs	6,679	530	31	723
Administrative	48,337	1,259	127	2,474
Legal	70,935	1,703	—	2,869
Travel Delay	387	187	107	543
Property Damage	3,132	1,255	450	2,752
Monetary Cost	426,409	13,956	752	22,855
Quality of Life	731,686	20,390	—	32,274
Comprehensive Cost	1,158,095	34,346	752	55,129

*Source: Levy and Miller (1995: 245).

Table 2
 Levy and Miller's Estimates of Total U.S. Costs of DWI Crashes by Incident Severity and Cost
 Category (in 1990 Dollars)*

	Fatal	Nonfatal Injury	PDO Vehicle	Costs for All Cases (\$ Millions)
Medical	6,693	4,203	—	4,127
Emergency Services	930	194	24	281
Productivity	665,453	7,919	35	19,391
Employer Costs	6,679	530	31	23
Administrative	48,337	1,259	127	2,474
Legal	70,935	1,703	—	2,869
Travel Delay	387	187	107	543
Property Damage	8,059	3,231	1,157	7,082
Monetary Cost	807,473	19,244	1,481	37,490
Quality of Life	1,977,529	48,367	—	80,832
Comprehensive Cost	2,785,002	67,611	1,481	118,322

*Source: Levy and Miller (1995: 245).²

sophisticated, inspection shows the study is far from scientific. Let us consider some of the problems.

A. Failure to Measure the Total Effects of the Project

Perhaps Levy and Miller's largest flaw is that they fail to demonstrate that the policy led to *any* benefits in the project area. To determine whether a program is efficient, one must compare the net benefits with and without the program. If a program decreases costs of one activity but simply shifts them elsewhere, then the program does not reduce social costs. Levy and Miller (1995: 241) recognize this: "A final issue that arises in evaluating many alcohol abuse programs is the possibility that a person may substitute other destructive behavior for the behavior curtailed by a successful program." This issue is of particular importance for their study. If consumers substitute alcohol consumption at taverns with alcohol consumption elsewhere, then reducing tavern drinking may not reduce drunk driving. Replacing one kind of drunk driving with another would simply shift problems, not eliminate them.

Other than mentioning it in two sentences, Levy and Miller all but ignore this issue. Actually, the data suggest that this is precisely what happened. After the implementation of the program, the number of arrests of taverngoers did decrease.

The data on citations indicated that the percentage of DWI arrestees whose last drink was at a tavern decreased from 31.7% during the first year before the program to 23.3% during the first year of the SIP program. The change in tavern-related fatalities was statistically significant at the $p \leq 0.01$ level for Washtenaw County using a chi-square test ($X^2 = 7.46$, 1 df). (1995: 242)

But while the number of tavern-related DWIs decreased from 128 to 112, the number of non-tavern-related DWIs *increased* by an even greater amount, from 276 to 323. Might it be the case that the policy caused the increase in DWIs? Levy and Miller ignore this very real possibility. By making consumption of alcohol in public places more difficult, the policy could have the perverse effect of encouraging more problematic drinking. Levy and Miller assume this away.

These estimates are based on the assumption that DWIs from taverns do not revert to other sources of alcohol consumption and then drive (e.g. refused drinkers curtail drinking or consume at home). If some proportion of those refused instead drive after drinking at friends' homes or turn to liquor stores or drugs, the benefits of the SIP enforcement fall by that proportion. Unfortunately, reliable data on the magnitudes of these affects are not available. (1995: 244)

Because reliable data are not available, Levy and Miller assume that the program is 100 percent effective, but that assumption is no more justified than an assumption that it is 0 percent effective. Because this empirical presupposition is of such importance to their argument, they must show that the assumption is well grounded, especially since evidence suggests it is not. Levy and Miller even provide statistics from other counties on the percentage of tavern-related DWIs (1995: 242), but unexplainably neglect to report whether total number of DWIs decreased or increased in the other counties.

Even though total DWIs actually increased, Levy and Miler choose to *only* consider how tavern-related DWIs decreased. They focus on how tavern-related DWIs decreased by 16 and ignore how the number of other DWIs increased by 47. This enables them to assume that the program has benefits.

B. Mixing of Private Costs and Social Costs

Even from the viewpoint of cost-benefit analysis, Levy and Miller's calculations of costs are questionable. Levy and Miller (1995: 241) explicitly mention that they "distinguish between costs borne directly by the individual drinker and external costs that are imposed on other parties," but they also write: "In applying the notion of social costs, the extent of costs borne by drinkers is often unclear, such as costs imposed on the family . . . and private insurers." Included in their estimates of external costs are drunk drivers' "compensated portion of medical costs" (Levy and Miller 1995: 244). But in most cases these costs are clearly internalized; when a private insurer offers an insurance policy, it estimates expected probabilities that customers will engage in risky behavior and charges higher premiums.³ For example, younger drivers pay more because they have a higher

likelihood of accidents. Premiums are formulated using actuarial tables, so groups of customers pay the costs of their actions, not the insurance company. Under a market, if a customer felt he or she was being pooled with people of dissimilar risks, the customer would be free to purchase insurance from another company. An insurance contract demonstrates that customers and insurers are willing to internalize these risks.⁴

Also included in social costs are "productivity losses for injuries to at-fault drivers" (Levy and Miller 1995: 244). But interpreting these as social costs is difficult. When people choose to drink while knowing they will have to drive home, they must weight the expected benefits with expected costs. The expected costs include possible productivity losses due to accidents, so when people make the decision, we can infer they value the drinking experience more than the risks of having lower productivity. Because people assume such risks, they cannot be counted as social costs.

Not only do they wrongly include internalized costs in their estimate of "external costs," Levy and Miller also produce another estimate of "total costs" that is extremely misleading for a cost-benefit analysis. Table 2 includes medical, legal, and personal property damage costs of drunk drivers *themselves*. Levy and Miller prominently display this table and imply that including private costs to the drinkers is useful for cost-benefit analysis. They write (1995: 246): "The assumptions underlying the external and the total cost measures are undoubtedly extreme. The best estimate certainly lies somewhere in between the two measures." Here they depart from standard analysis. Because drunk drivers are willing to bear these expected costs, they are not relevant for cost-benefit analysis.

C. Ignoring Lost Producer Surplus Associated with Alcohol

Perhaps the most objectionable aspect of Miller and Levy's analysis is what they count in the costs-and-benefit ledger for the SIP program. On the benefit side they count decreased costs of drunk driving; on the cost side, what do they count? Miller and Levy (1995: 244) write: "The primary costs of enforcement are for additional police and supervisory staff." According to these authors:

Total police, supervisory and miscellaneous costs for Ann Arbor city and Washtenaw county police were \$48,400. An additional \$3,000 was incurred to publicize the program and train individuals. Adding these start-up costs yields total costs of \$51,400. (1995: 245)

To Levy and Miller (1995: 244), the total benefits of the program range in the millions of dollars and the costs are only \$50,000, yielding a very high benefit-cost ratio. But are police costs the only costs of the program? The purpose of cost-benefit analysis is to measure the total of consumer and producer surplus with and without a project. When any good is sold on the market we know that both the buyer and the seller gain, but Levy and Miller completely exclude consumer surplus and producer surplus from their calculations.

Even though the program may cause a serious decline in taverns' alcohol sales, Levy and Miller do not count lost producer surplus as a cost of the program. They write:

We also exclude costs to tavern owners . . . While tavern owners may experience a small loss of sales to intoxicated patrons, reduced risks of doing business (including property loss from drunk and disorderly behavior and costs of legal suits for serving the intoxicated) may yield some offsetting benefits. (1995: 245)

But a cost-benefit analysis requires inclusion of costs to tavern owners. Even the internal logic of Levy and Miller's sentence makes little sense. If ceasing to serve intoxicated patrons only leads to a small decrease in sales, how can they expect a large decrease in property damage at taverns? Taverns know that customers might damage their property, but the expected costs of such damage must be less than revenue from such customers; otherwise, taverns would not choose to serve them.

To get a better estimate of the offsetting "savings" to taverns, we conducted a survey of the taverns in Washtenaw County. We mailed a questionnaire to every one of Washtenaw County's 40 "Bars, Pubs, and Clubs" listed in Yahoo!® Yellow Pages.⁵ We tried to get an idea of the size of each tavern, how much business was related to alcohol, and how the alcohol restrictions would affect business. We tried not to elicit responses that might sound incriminating, and we informed managers that their responses would remain anonymous. The survey

fit on one page, and we enclosed a dollar bill in each envelope to encourage the taverns to complete it. The questions and their responses are reproduced in Table 3. The postal service returned two letters as undeliverable, and we received 15 replies, a response rate of 39 percent. Our survey attempts to fill what we believe are important gaps in Levy and Miller.

Using Levy and Miller's (1995: 245) words, we enquired about how much resources taverns spend on property loss "from drunk and disorderly behavior." The responses were in stark contrast to the assertions of these Ph.D. economists. Rather than being large, the average tavern's repair bills for property damaged by their customers is less than 1 percent of sales. For anyone who has been to a bar and noticed it is different than the depictions from old Western films, these responses are not surprising.⁶ We also asked how much resources taverns devoted to legal suits related to alcohol and received a mean response of zero. Granted, these costs might be hidden in the form of higher insurance premiums⁷ or other operating expenses, but they do not seem to be as large as Levy and Miller imply. The total "offsetting benefits" of implementing such alcohol restrictions seem to be less than 1 percent of sales.

For the other side of the equation, we tried to get an estimate of how much sales would decrease if the government clamped down on patrons becoming intoxicated. We stated the question in terms of consistent demand-side interdiction to indicate that we meant effective prohibition.⁸ The average establishment received just over 50 percent of its revenue from alcohol and estimated its revenue would decrease by about 20 percent with such enforcement. Taverns might have been overestimating the decrease, but such responses seem much more credible than the off-the-cuff empirics of Levy and Miller. According to these two estimates, we can see that strict enforcement of the policy would lead costs to decrease by around 1 percent and revenues to decrease by around 20 percent. Levy and Miller's speculation that the policy would lead to "a small loss of sales" and "some offsetting benefits" is difficult to defend. Producers enter a business because they find it worthwhile, and unless one is prepared to make some peculiar assumptions, as Levy and Miller do, the loss in producer surplus will be significant.

Table 3
Alcohol Survey of Taverns in Washtenaw County, Michigan

Question	Mean Response	Standard Deviation	Response Rate ⁹
1 If a patron in Washtenaw County had a Blood Alcohol Content of 0.10, what percentage of the time could he purchase alcohol in a typical establishment (not necessarily yours)? (for example 0% if he would never be served; 100% if he would always be served)	65%	(38%)	[0.32]
2 For every \$1,000 in alcohol you sell, on average how much money do you spend repairing your property damaged from drunk and disorderly behavior?	\$8.76	(\$28.74)	[0.32]
3 For every \$1,000 in alcohol you sell, on average how much money do you spend on legal suits related to alcohol?	\$0	(\$0)	[0.34]
4 Please give a rough estimate of the following averages for your establishment:			
a Number of customers per day	182	(135)	[0.34]
b Percentage of customers who do not drink alcohol	20%	(13%)	[0.34]
c Percentage of your gross revenue from alcohol sales	57%	(27%)	[0.32]
d Number of alcoholic drinks you sell per week	3,149	(3,494)	[0.29]
5 If government consistently arrested your customers with a Blood Alcohol Content of 0.10 or higher, what percentage decrease in total sales would you predict? (for example 0% if none; or 100% if an establishment had to close down)	25%	(36%)	[0.34]

D. Ignoring Lost Consumer Surplus Associated with Alcohol

If Levy and Miller's treatment of producer surplus is not bad enough, their treatment of consumer surplus is even worse. They write:

A related issue is whether to incorporate any loss in satisfaction from curtailing destructive behavior. When an individual's decision reflects an informed and rational evaluation that the satisfaction from drinking is greater than the monetary costs and risks, it may be argued that the value of satisfaction loss from curtailing excess drinking should be deducted from the social benefits. (1995: 241)

The new alcohol restrictions would lower consumer surplus to those prohibited from purchasing drinks at taverns. Not only would it restrict people who want to drink and drive, but it would restrict people who do not drive at all.

But if accidents are the concern, is prohibiting all people from becoming inebriated the least costly solution? The consumer surplus for all drinkers would be decreased, regardless of whether they drive. In Washtenaw County specifically, many of the taverns are within walking distance of the University of Michigan, yet Levy and Miller believe it better to prevent everyone from becoming intoxicated.¹⁰ One manager told us, "I'm in a small community and most of my patrons walk and do not drive. I do cut off people who drive" (Personal correspondence, Manager #12, March 10, 2003). But serving-intoxicated-patron laws apply regardless of whether the drinkers intend to drive.

Even though the law severely limits how much everyone can drink, Levy and Miller do not consider this a cost of the program. According to these authors:

However, the SIP program is specifically intended to enforce a law that prohibits tavern drinking after becoming intoxicated. While one might question the wisdom of the law, excess drinking is not an individual property right sanctioned by society. Therefore, any consumer losses from curtailing the illegal activity are not considered a relevant social cost in evaluation the SIP program. (1995: 241)

To Levy and Miller, there are no individual rights to engage in "excess drinking," and because it has been made illegal, all of a sudden we are to disregard the well-being of drinkers.

But taking this approach severely damages the legitimacy of their analysis. Whether we support its conclusions or not, cost-benefit analysis is supposed to provide “an economic basis for evaluating a public policy or program” (Levy and Miller 1995: 240). Practitioners of cost-benefit analysis are supposed to look at the net effects of a policy, but if they are choosing to ignore classes of benefits for moral reasons, they are not engaging in cost-benefit analysis. Levy and Miller (1995: 241) cite an article by Zerbe (1995) that questions the moral standing of cost-benefit analysis. One might agree that cost-benefit analysis does not have a strong moral standing and should not be used (Stringham and White 2004). But if one engages in cost-benefit analysis, one cannot pick and choose which benefits to count and which to ignore.

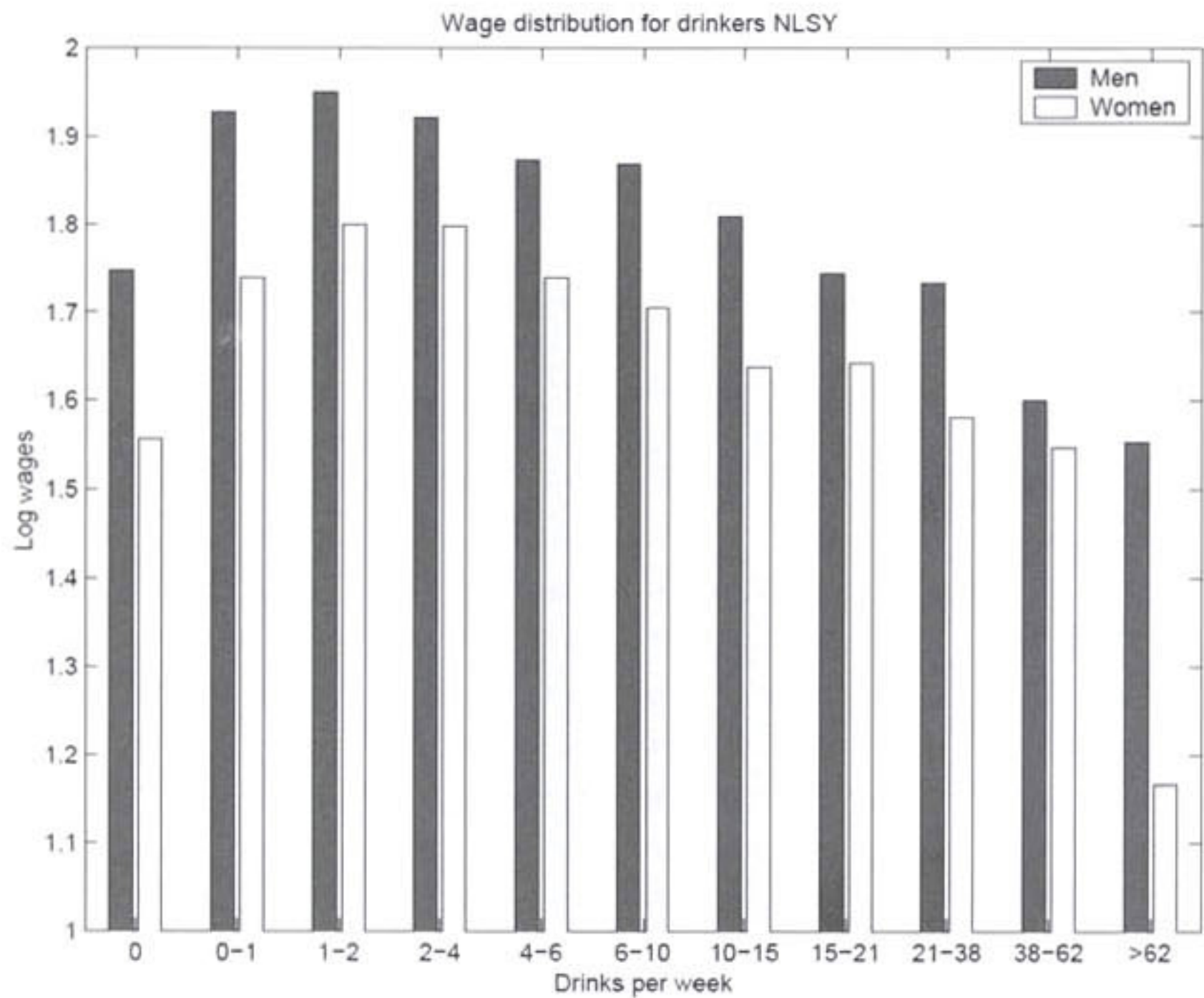
By ignoring the costs imposed on drinkers, Levy and Miller stack the deck so it is all but impossible for the program to be considered inefficient. Their entire support for the project is based on a moral presupposition that drinking needs to be restricted. Levy and Miller (1995: 240) write: “The purpose of this article is not only to present a cost-benefit analysis of the SIP program but also to examine issues that commonly arise in cost-benefit analyses of programs aiming at altering *harmful* behavior” (emphasis added). But this assumption is not justified. Levy and Miller ignore all the positive effects of alcohol.

In addition to its consumption value, economic data actually indicate that drinkers’ income is significantly higher than that of abstainers (MacDonald and Shields 2001). Peters (2002) demonstrates that, *ceteris paribus*, the average person has to drink *more than* 21 drinks every week before one’s income will be as low as that of the average teetotaler (Figure 1). If we do not hold occupation constant, the results showing the wage penalty of abstainers are even more striking because drinkers tend to select into higher paying lines of work than nondrinkers (Barrett 2002). Panel data seems to confirm the casual empirics that the average nondrinker has less social capital than the average drinker (Peters 2002). Viewing drinking as an anti-social activity, as Levy and Miller do, is no more justified than viewing abstaining as an antisocial activity.

Even were alcohol consumption uncorrelated with higher earnings, Levy and Miller still cannot justify disregarding the consumption value of drinking. Yet Levy and Miller are hardly concerned with drinkers’

Figure 1

Alcohol Consumption and Wages



Source: Peters (2002).

choices at all: “In particular, it is important to consider . . . whether to include benefits to the individual from reducing their own destructive behavior” (1995: 246). But Levy and Miller certainly cannot claim to be measuring costs and benefits if they ignore decisions of consumers. Levy and Miller (1995) appear scientific but attack alcohol with the presuppositions that government *should* restrict alcohol and that individuals’ choices and welfare should be ignored.

IV

Conclusion

DESPITE LEVY AND MILLER’S DETAILED ACCOUNT, the analysis showing the efficiency of restricting alcohol is extremely questionable. Even

though total DWIs increased after the program was implemented, Levy and Miller assume that the program decreased DWIs. The authors then calculate the benefits of the program in a dubious manner, including various private costs as social costs. For the costs, Levy and Miller only count police expenditures and completely ignore lost producer and consumer surplus associated with the restrictions. Our survey of tavern owners indicates that Levy and Miller's assumptions are wildly erroneous. If we change any number of their pre-suppositions, the case for restricting alcohol consumption in taverns breaks down.

Looking at other articles by Levy and Miller, one can unearth similar problems.¹¹ Unfortunately, most noneconomists do not have the background to see the major flaws in this work. Government agencies might not question the soundness of articles showing the social costs of alcohol because the conclusions are convenient. In fact, government finances much of their "research" to support specific conclusions.¹² Maybe the entire endeavor of scientific quantification is a charade (Stringham 2001). Friedrich Hayek's ([1974] 1989) Nobel lecture warned against economists who write under the pretense of scientism where the rigor is only apparent. Complicated equations and statistics can be used to mask what Bastiat (1964) called "economic sophisms." If government can lead the public to believe that it has science on its side, it has an easier time enforcing laws that people would otherwise oppose (Caplan and Stringham 2005). Portraying studies as scientific economics is highly misleading. Unfortunately, Levy and Miller do just that.

Notes

1. Enforcement efforts to limit alcohol consumption in taverns have increased in recent times. For example, in December 2002 police in Fairfax, Virginia, started arresting intoxicated individuals in taverns (Cella 2003).

2. Levy and Miller's tables appear to have missing rows, typos, or errors in arithmetic because only two of the eight columns in their tables add to what Levy and Miller say they do. For example, the entry for *external employer costs* is \$723 but the entry for *external employer costs + private employer costs* is only \$23. These problems do not change the substance of their article, but are worrisome nonetheless.

3. Although an individual who engages in personally damaging behavior is imposing costs on himself or herself, by choosing that course of action we know the individual considers the personal benefits greater than the personal costs. Because individuals take private costs into account, they are not counted as social costs in cost-benefit analysis.

4. Although Levy and Miller are not clear whether they include "costs imposed on the family" (1995: 241) in their estimates of social costs, costs imposed on family members should not be considered a social cost. Marriage entails two people agreeing to internalize costs and benefits. Before a marriage each partner must estimate the expected net benefits, which includes costs and benefits due to spousal drinking. A potential spouse unwilling to bear such costs is perfectly free to marry a teetotaler, so those who choose to be a part of a family demonstrate their preference that expected benefits exceed expected costs. Even if an individual decides to be a complete drunkard, which involves costs, when we are dealing with contractual relationships the costs are borne exclusively by the drinker and are not social costs.

5. Just over half of the establishments were located in Ann Arbor, with the others located in Ypsilanti, Milan, Saline, Dexter, Chelsea, and Manchester.

6. Given the gross inaccuracy of their statements, we believe it is safe to assume Levy and Miller have little experience in regular taverns.

7. In the words of one manager: "Insurance coverage is very expensive" (Personal correspondence, Manager #5, March 5, 2003).

8. One-hundred-percent-effective prohibition would produce the same effects on total revenue, whether through demand-side or supply-side interdiction.

9. When answers contained words such as "Not much," we exclude them from our sample.

10. In our personal correspondence, a number of managers also questioned the one-size-fits-all blood alcohol content laws. In the words of one, "Blood Alcohol Content does not always indicate who is drunk/impaired. I have seen people with a very high tolerance for alcohol drink a lot but not appear intoxicated. Similarly I have seen people with a lower tolerance (an infrequent drinker) appear very intoxicated on only one drink" (Personal correspondence, Manager #14, March 25, 2003). Other managers voiced similar concerns (Personal correspondence, Manager #6, March 7, 2003; Personal correspondence, Manager #13, March 24, 2003).

11. Interestingly, Miller and Levy refer to other articles by themselves with glowing praise, including self-descriptions such as, "technically sound," "pioneered a methodology" (Miller and Levy 1998: 462), and "improved methodology" (Levy and Miller 1995: 241).

12. One report (Levy, Miller, and Cox 1999: 1) prepared for the Office of

Juvenile Justice and Delinquency Prevention explicitly states: "prepared in support of the OJJDP Enforcing Underage Drinking Laws program."

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Appendix:

Letter for Survey of Taverns in Washtenaw County, Michigan

Dear Manager of <Tavern 1>:

We are economists conducting a study about whether restrictions against serving intoxicated patrons are costly to restaurants and bars in Washtenaw County. Enclosed is a dollar in appreciation for filling out the survey. Your answers will be anonymous. We really appreciate your help.

Thanks,

Professor Edward Stringham and Miss Ilkay Pulan

OPTIONAL: IF YOU CARE TO WRITE ANY COMMENTS OR OPINIONS ABOUT RESTRICTIONS ON SERVING ALCOHOL PLEASE DO SO. (We would be interested including quotes) We will gladly send our final study to anyone interested. If you are interested in having a short conversation about the topic you can leave your phone number. THANK YOU FOR YOUR PARTICIPATION